JSC Policy Directive

JPD 8090.1

EFFECTIVE DATE: March 14, 2003

EXPIRATION DATE: March 14, 2008

RESPONSIBLE OFFICE: AG/Office of the JSC Chief Engineer

SUBJECT: JSC Systems Engineering Policy

1. POLICY. It is the policy that JSC organizations emphasize systems engineering on all JSC systems during their acquisition, design, development, test, evaluation, operations, and sustaining engineering. To this end JSC will:

a. Identify a consistent set of systems engineering requirements, processes, and products for the development and operation of JSC systems consistent with the complexity, cost, and risk associated with the system.
b. Measure the effectiveness and efficiency of JSC systems engineering processes as a basis for continuous improvement.
c. Establish organizational responsibilities for performing, controlling, monitoring, training personnel, and setting standards for systems engineering activities, functions, and tools.

2. APPLICABILITY. This JPD is applicable to all JSC flight and ground systems during all life cycle phases, regardless of cost or size.

3. REFERENCES.

a. ANSI/EIA-632-1998, "EIA Standard, Processes for Engineering a System"
b. NPG 7120.5B, "NASA Program and Project Management Processes and Requirements"

4. DEFINITIONS.

a. **Systems Engineering –** The definition, implementation, and integration of a system (product or service) with emphasis on the functional, physical, and operational performance in its intended environment. Systems engineering focuses on the management of technical decisions that address the performance, safety, mission criticality, and operations across all elements of the system, and its interfaces with other systems. The systems engineer provides technical management for these decisions, as delegated by the project manager, within the cost, schedule, and risk constraints levied by the project, program, or operations manager.

5. RESPONSIBILITIES.

a. The JSC Chief Engineer's Office is responsible for:

1) Establishing policy, requirements, and guidelines for systems engineering processes and products for the development and operation of JSC systems.
2) Establishing requirements for measuring the effectiveness and efficiency of JSC systems engineering processes.
3) Monitoring and assessing compliance of JSC activities to this JPD.
4) Ensuring compliance of JSC systems engineering activities with NASA policies and guidelines.
5) Defining a systems engineering development program.

b. The Directorate Level Organizations (DLO's) are responsible for:

1) Ensuring that the engineering activities within the organization utilize systems engineering for:
    a. Understanding and assessing the customer's technical needs and expectations for the system (request for product and services).
    b. Planning and organizing the technical definition, implementation, and integration of the system (product or service).
    c. Developing the system's integrated technical requirements, including technical inputs from stakeholders, and detailing those requirements to enable feasible and cost-effective design solutions.
    d. Performing trade studies to evaluate alternative technical solutions, and selecting and detailing the technical solution that best meets requirements.
    e. Ensuring the implementation of the selected technical solution.
    f. Verifying and validating that the technical implementation satisfies the integrated technical requirements.
    g. Assessing and managing the technical risk.
2) Documenting the processes and procedures for performing systems engineering within the DLO's.
3) Identifying personnel requiring systems engineering training and ensuring that the training is completed in a timely fashion.
4) Measuring the effectiveness and efficiency of the DLO's systems engineering processes.

c. The JSC Human Resources Office is responsible for

1) Developing and implementing a training curriculum that supports the JSC systems engineering development program.
2) Tracking workforce participation in the systems engineering development program.

6. MEASUREMENT. Periodic reviews will be performed to ensure this policy is being followed. As part of this Policy, the methodology to measure the effectiveness and efficiency of JSC systems engineering processes will be determined and implemented.

7. RESCISSION. None

(Original signed by Jefferson D. Howell, Jr., March 14, 2003)

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Jefferson D. Howell, Jr.
Director

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